MERIDIAN™
YACHTS

PARTS AND CUSTOMER SERVICE BULLETIN

BULLETIN #: 2006-01
DATE: 1/6/06

1. BEP Thruster Battery Switch Failures and Troubleshooting Guide

1. BEP Thruster Battery Switch Failures and Troubleshooting Guide

We have received some reports of BEP thruster battery switch failures. After investigating this issue we have determined these battery switches can fail to connect over time when the thruster controller switches are pressed.

Nature of the Failure

The battery switch, over time, fails to connect when the controllers on the switches are pressed. The battery switch is sensitive to differences between the reference ground, a black wire, and the switched ground, a red wire. When the switching voltage between the two grounds exceeds 0.8 volts of DC current the battery switch will try to disconnect while in the auto mode. Two contributing factors can be loose wire connections and a long length of the circuit from the switch to the relay. We have included step-by-step instructions to assist in the correction of failed thruster battery switches. In the event you encounter a Meridian Yacht needing this correction, please telephone our Customer Service team to obtain an authorization.

Troubleshooting Guide

Imtra Corporation has reported a significant number of Docking On Command (DOC) controls returned to them as defective that, when checked, tested good. In an effort to assist our dealers in accurately diagnosing the source of failures in the DOC system we have also included with this bulletin a troubleshooting guide for our thrusters. In the event the source of a thruster problem is not able to be identified, please telephone or e-mail our Customer Service team for assistance before ordering replacement parts.

P.O. Box 9029 Everett, WA 98206 U.S.A. Phone: (877)-861-6494 Fax: (866)-937-8207

Model: Multiple
Date: 11/06/2005
Author: Mark Housel
Subject: **Meridian Thruster Ground control**
Option: Standard

Instructions for installation of the following parts on Meridian Yacht Thruster systems.

The intention is to add an additional grounding relay to each thruster to shorten the circuit. Part selection is as listed in Table 1.

MODEL	BOW THRUSTER HARNESS	STERN THRUSTER HARNESS
341NSB	1816254	1816255
368MY	1816255	1816254
391SB	1816254	1816256
408MY	1816154	1816254
411SB	1816254	1816255
459CMY	1816254	1816254

Table 1

1. **1816254 MERIDIAN 06,HARNESS,THRSTR CNTRL GND 1M**
2. **1816255 MERIDIAN 06,HARNESS,THRSTR CNTRL GND 2M**
3. **1816256 MERIDIAN 06,HARNESS,THRSTR CNTRL GND 3M**

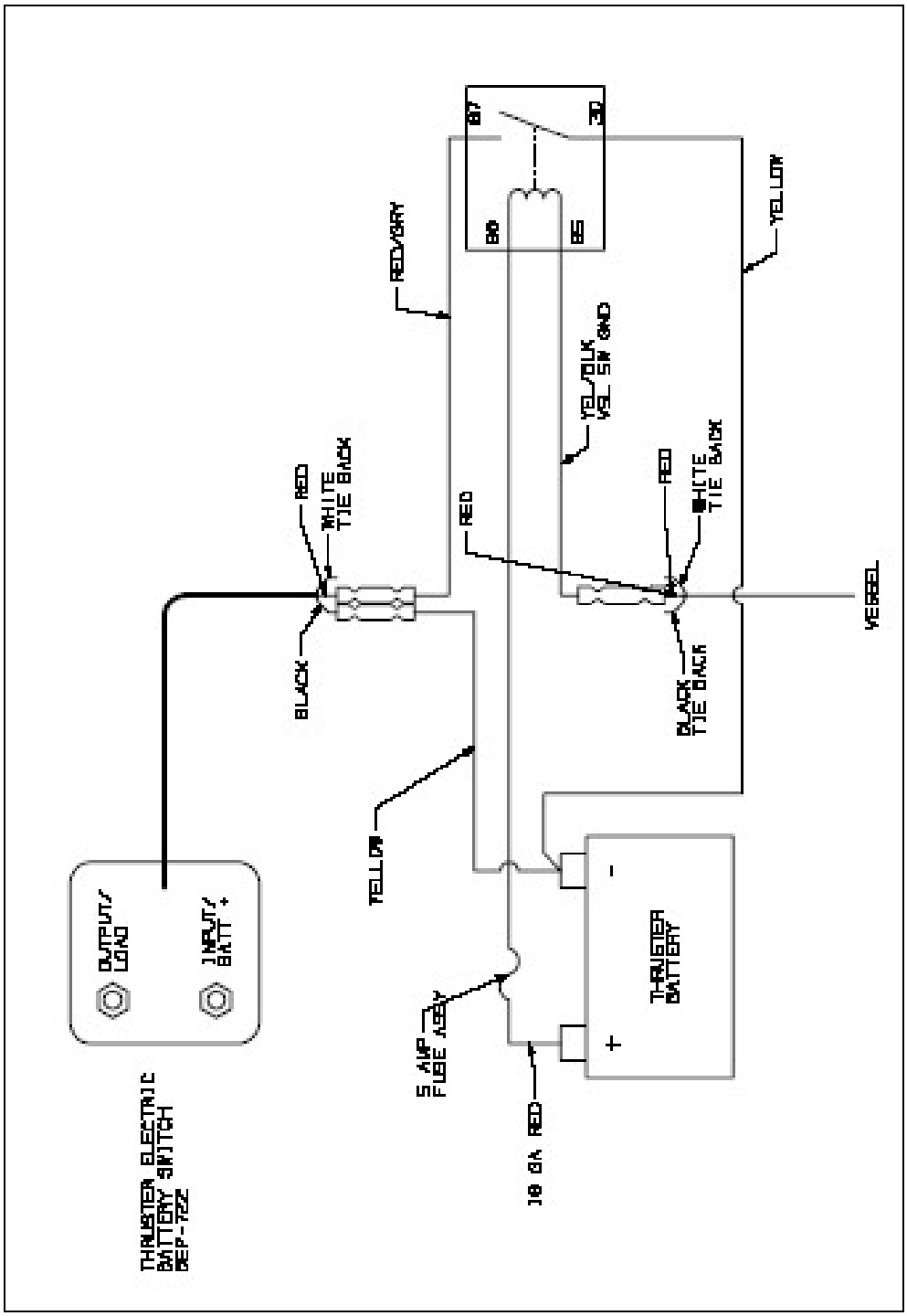
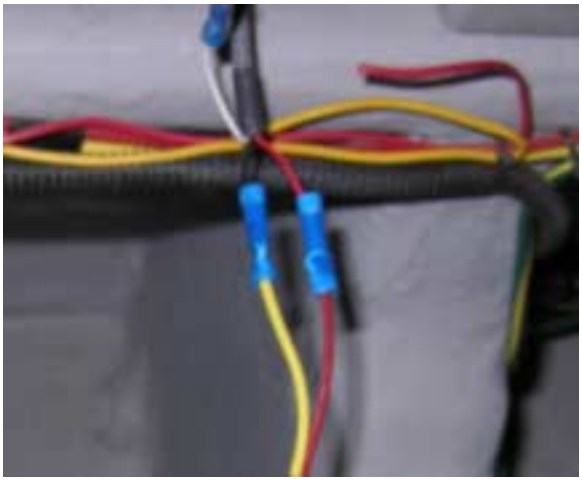

87
30
86
85
RED/GRY
YELLOW
YEL/BLK
VSL SW GND
RED
WHITE
TIE BACK
RED
RED
WHITE
TIE BACK
VESSEL
BLACK
BLACK
TIE BACK
YELLOW
OUTPUT
LOAD
INPUT
BATT +
THRUSTER
BATTERY
-
+
5 AMP
FUSE ASSY
10 GA RED
THRUSTER ELECTRIC
BATTERY SWITCH
BEP-722

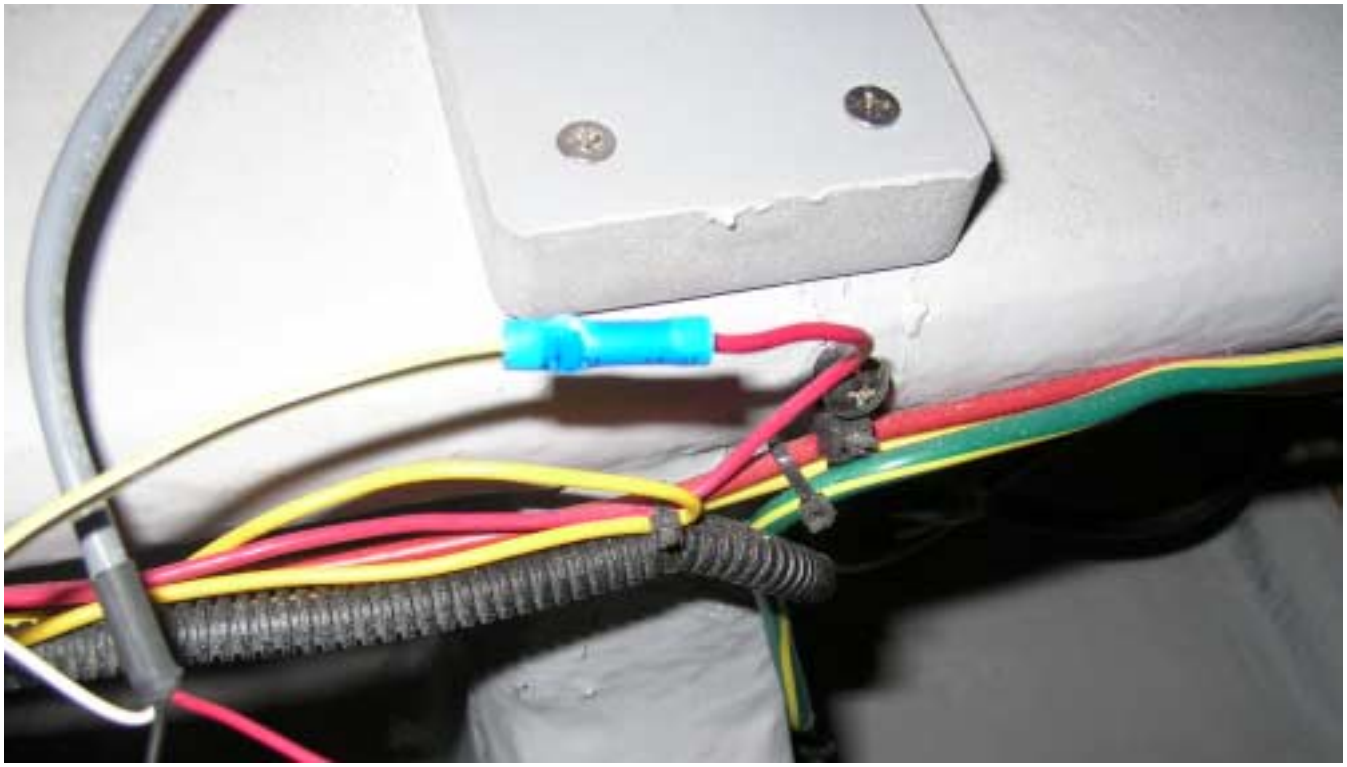
Figure 1

1. Position Relay within 12 inches of thruster battery switch.

2. Route fuse and ground wiring to nearest thruster battery.
3. At thruster switch, disconnect existing boat wiring from thruster battery switch.
4. Connect ground control harness wiring to battery switch as shown: Black to Yellow, Red to Red.



5. Connect Boat harness to ground control harness Boat side Red to Ground control yellow/Black. Isolate and tie back other boat harness wiring.



6. Connect Battery wiring, Yellow to Negative (-), Red with Fuse-holder to Positive (**+**)

7. Test system

    a. Place battery switch in Auto position
    b. Press both “on” switches on D.O.C. Controller
    c. Battery switch should close and red indicator lights should turn on.
    d. Operate thruster in both directions.
    e. Depress “off” button on D.O.C. Controller, battery switch should open and thruster should be inoperative at this time.

MERIDIAN YACHTS

ELECTRICAL SYSTEMS ENGINEERING

Meridian Thruster Battery Distribution System.

Basic Operation of the thruster battery switches is accomplished by remote. By depressing both “on” switches at the controller the switches are closed connecting the batteries to the thrusters.

The Controller is powered from a fuse connected to the line side of the Bow thruster battery switch. When energized it provides a 12V signal used to trigger a relay. Refer to Figure 1. The relay is typically located behind or near the battery management or DC main panel, depending on the model of boat. When triggered this relay connects the DC ground buss to the red wire at the thruster battery switch. The thruster battery switch compares this to the reference ground attached to the black wire at the battery switch. If they agree within 0.8VDC the battery switch closes. Connecting the battery to the thruster. At this time thruster control is available from the helm.

Failure Modes

When the battery switch operates in “Manual”, but no longer operates in “Auto”:

The battery switch is sensitive to differences between, reference ground (black wire) and switched ground (red wire). When the switching voltage between these two wires is greater than 0.8Vdc, (figure 2) the battery switch will try to disconnect, while in auto mode. This can happen over time, if connections are loose and the circuit length from the switch to the relay is long.

If this condition exists for a period of time, the battery switch will also fail due to being only partially connected, while carrying the full load of the thruster. If this occurs the battery switch will no longer operate in the manual mode. It is recommended that the battery switch be replaced if the thruster system has operated under this condition.

Meridian Thruster Control Diagram

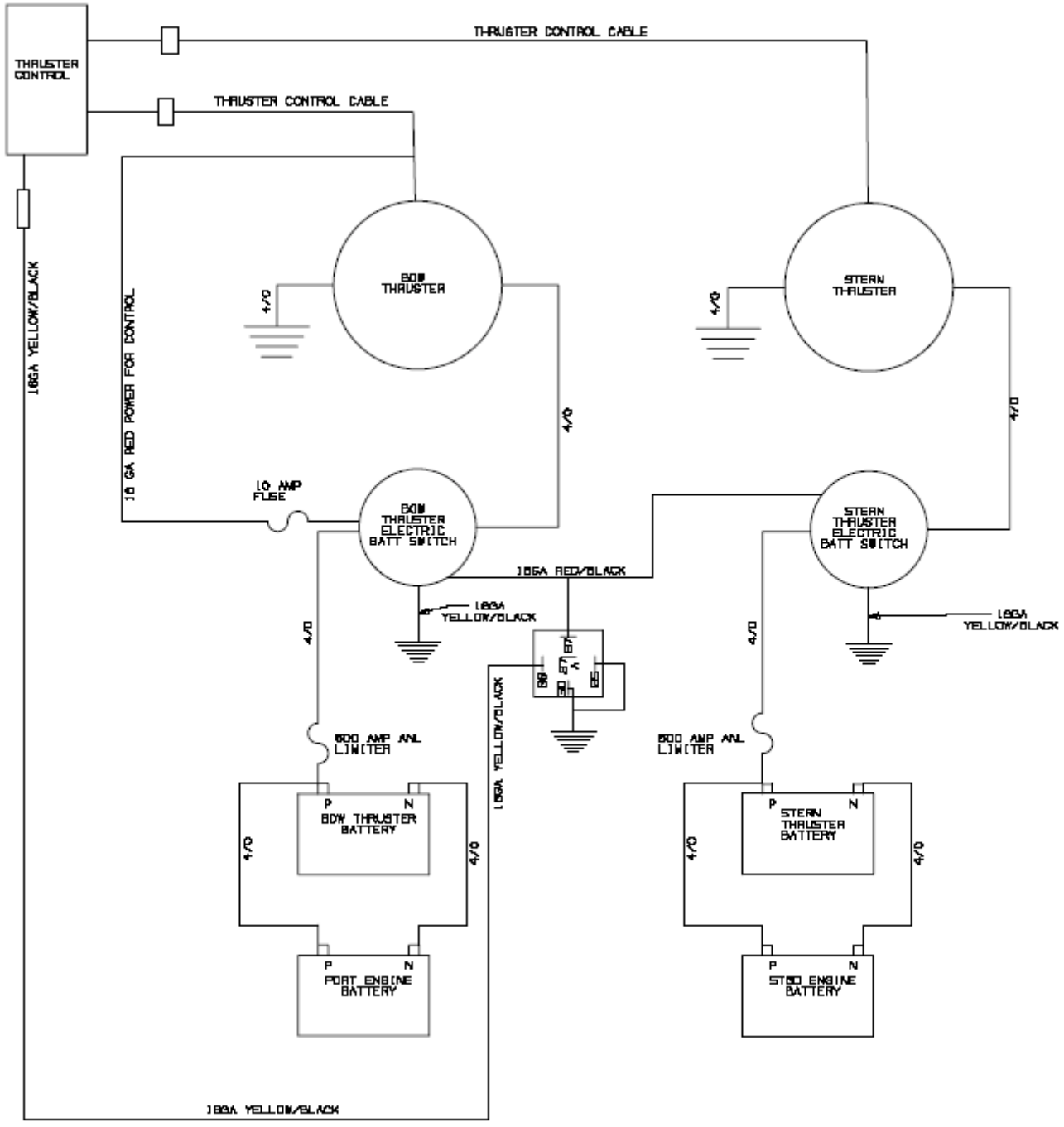


Figure 1

Basic Thruster battery switch control

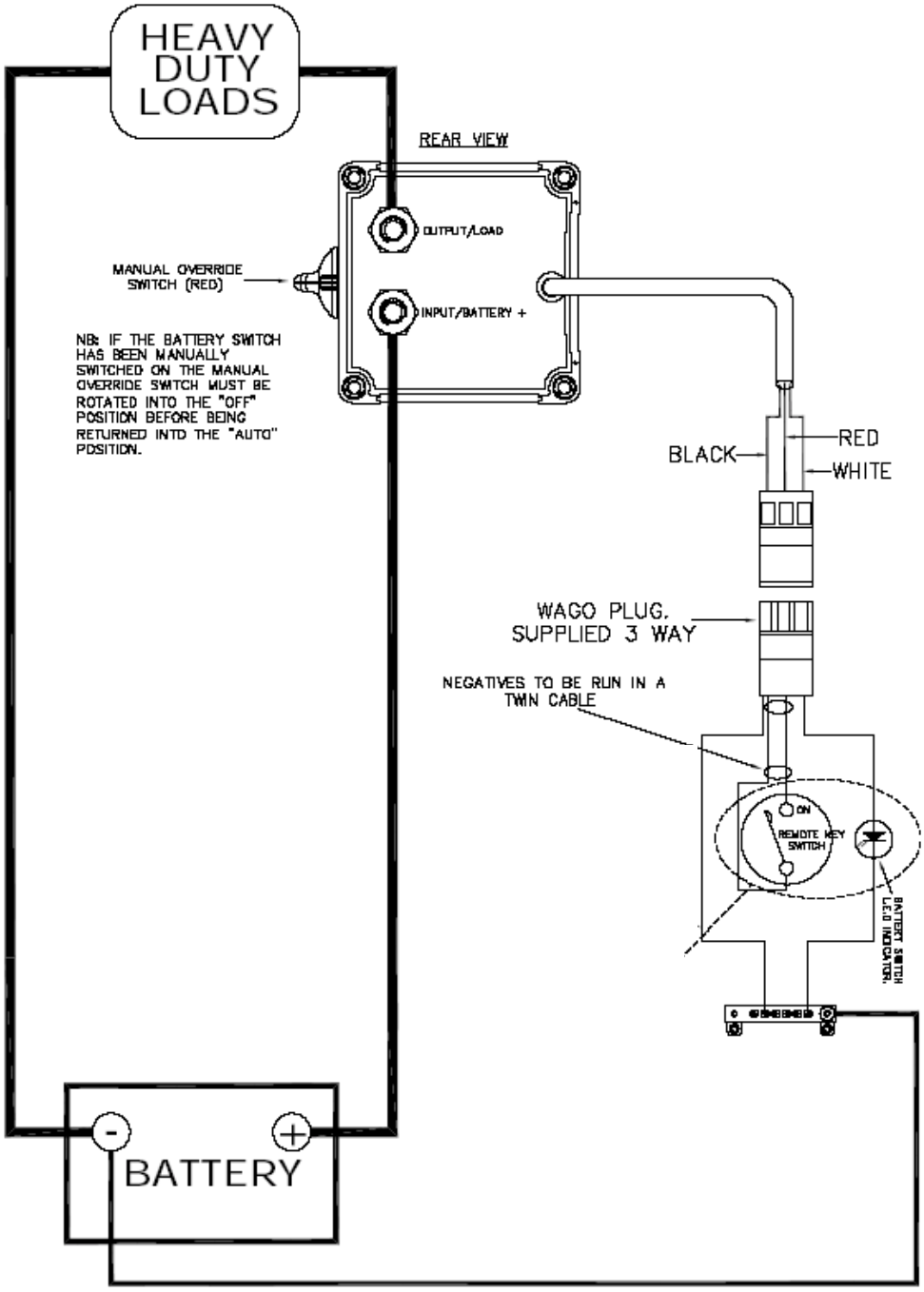

HEAVY DUTY LOADS
REAR VIEW
OUTPUT/LOAD
INPUT/BATTERY +
MANUAL OVERRIDE SWITCH (RED)
NB: IF THE BATTERY SWITCH HAS BEEN MANUALLY SWITCHED ON THE MANUAL OVERRIDE SWITCH MUST BE ROTATED INTO THE "OFF" POSITION BEFORE BEING RETURNED INTO THE "AUTO" POSITION.
BLACK
RED
WHITE
WAGO PLUG. SUPPLIED 3 WAY
NEGATIVES TO BE RUN IN A TWIN CABLE
ON
REMOTE KEY SWITCH
BATTERY SWITCH L.E.D INDICATOR.
BATTERY

Figure 2

Trouble Shooting Guide

1. Perform resistance checks to validate wiring and components up-circuit of battery switch. This will confirm that controller wiring and cabin relay are operating correctly.

Check	System Condition	Check	Expected value	Indicates
Verify Thruster controller and original cabin ground relay work as designed	Thruster Controller off. E-Battery switch in auto.	E-Batt switch Black wire, resistance to ground	Low resistance typically less than 2 Ω	Good switch ground
Verify Thruster controller and original cabin ground relay work as designed	Thruster Controller off E-Battery switch in auto.	E-Batt switch Red wire, resistance to ground	High resistance typically greater than 1M Ω	Controller off, battery switch off.
Verify Thruster controller and original cabin ground relay work as designed	Thruster Controller on E-Battery switch in auto.	E-Batt switch Red wire, resistance to ground	Low resistance typically less than 2 Ω	Battery switch should close, thruster should be operational, Controller and cabin wiring good.

Table 1

2. Verify Thruster Motor is operational: Note if problem has progressed to complete battery switch failure, this check will fail and be reevaluated later. Place the battery switch in the manual position. Turn on thruster controller, operate thruster.

3. If Battery Switch does not operate in auto-mode: Battery switch in Auto mode, turn Thruster controller on. Using two Jumper wires at Electric Battery switch connect red wire to black wire and connect to thruster battery ground. Battery switch should close. If switch closes under this condition, the latching voltage is from ground to switch ground is too high. Add thruster grounding harness as shown in figure 3. Select your part number for the table listed on the next page (table 1)

MODEL	BOW THRUSTER	STERN THRUSTER
341NSB	1816254	1816255
368MY	1816255	1816254
391SB	1816254	1816256
408MY	1816154	1816254
411SB	1816254	1816255
459CMY	1816254	1816254

Table 2

1. **1816254 MERIDIAN 06,HARNESS,THRSTR CNTRL GND 1M**
2. **1816255 MERIDIAN 06,HARNESS,THRSTR CNTRL GND 2M**
3. **1816256 MERIDIAN 06,HARNESS,THRSTR CNTRL GND 3M**

Diagram with ground control harness and relay installed (typical bow and stern)

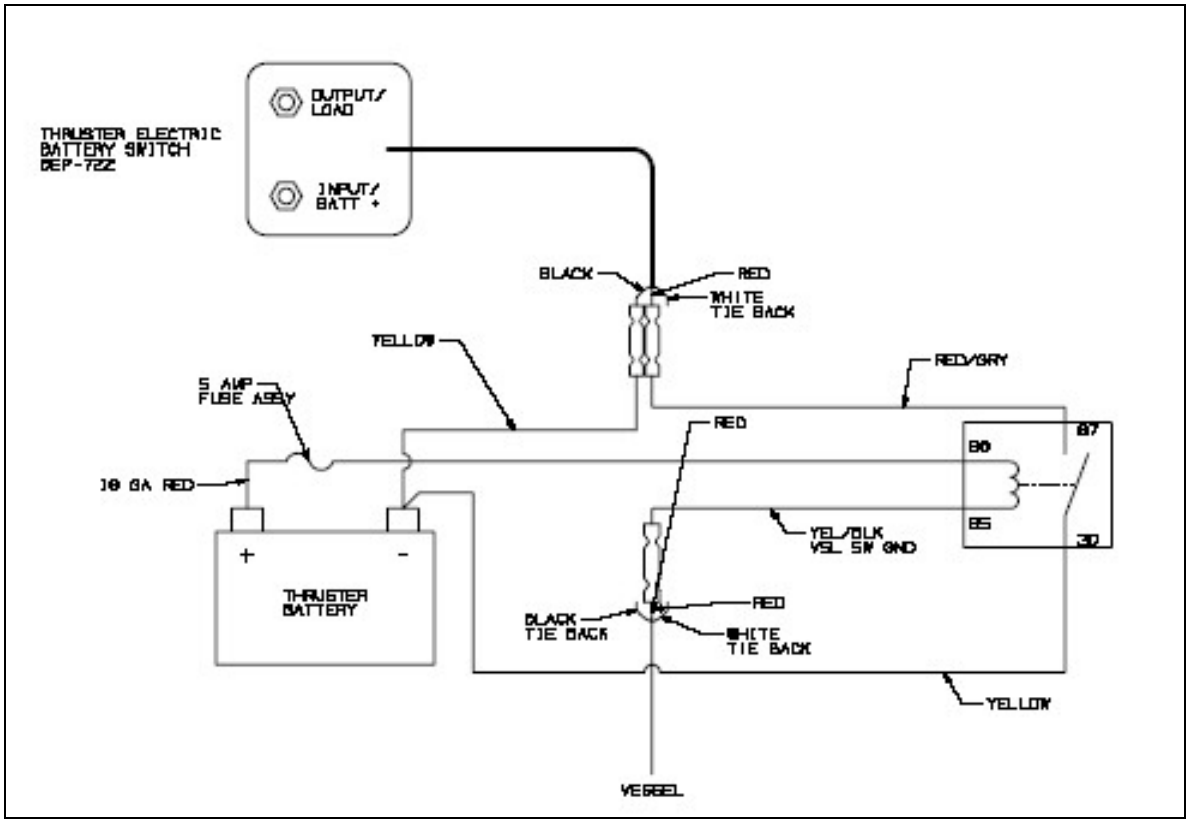


Figure 3

1. Mount relay within 12 inches of battery switch
2. Connect fused wire to positive battery post and battery ground to Negative battery post of Thruster battery.
3. At thruster battery switch connect Yellow wire to Black wire on switch, Connect Red/grey wire to red wire on Thruster battery switch.
4. Connect Yellow/Black wire to Vessel harness red wire. Tie back